

the motion upwards, the side *A* will be depressed to *E*, and therefore *C* being thrust to *G* and *D* to *H*; the globular Figure by this means also will be made an *Elliptico-spherical*. Next if a fluid be included partly with one, and partly with another fluid, it will be found to be shaped diversly, according to the proportion of the gravity and incongruity of the 3 fluids one to another: As in the second Figure, let the upper *M M M* be Air, the middle *L M N O* be common Oyl, the lower *O O O* be Water, the Oyl will be form'd, not into a spherical Figure, such as is represented by the pricked Line, but into such a Figure as *L M N O*, whose side *L M N* will be of a flatter Elliptical Figure, by reason of the great disproportion between the Gravity of Oyl and Air, and the side *L O M* of a rounder, because of the smaller difference between the weight of Oyl and Water. Lastly, The globular Figure will be changed, if the ambient be partly fluid and partly solid. And here the termination of the incompass'd fluid towards the incompassing is shap'd according to the proportion of the congruity or incongruity of the fluids to the solids, and of the gravity and incongruity of the fluids one to another. As suppose the subjacent medium that hinders an included fluids descent, be a solid, as let *K I*, in the fourth Figure, represent the smooth superficies of a Table; *E G F H*, a parcel of running Mercury; the side *G F H* will be more flattened, according to the proportion of the incongruity of the Mercury and Air to the Wood, and of the gravity of Mercury and Air one to another; The side *G E H* will likewise be a little more depressed by reason the subjacent parts are now at rest, which were before in motion.

Or further in the third Figure, let *A I L D* represent an including solid medium of a cylindrical shape (as suppose a small Glass Jar) Let *F G E M M* represent a contain'd fluid, as water; this towards the bottom and sides, is figured according to the concavity of the Glass: But its upper Surface, (which by reason of its gravity, (not considering at all the Air above it, and so neither the congruity or incongruity of either of them to the Glass) should be terminated by part of a sphere whose diameter should be the same with that of the earth, which to our sense would appear a straight Line, as *F G E*, Or which by reason of its having a greater congruity to Glass than Air has, (not considering its Gravity) would be thrust into a concave sphere, as *C H B*, whose diameter would be the same with that of the concavity of the Vessel: ) Its upper Surface, I say, by reason of its having a greater gravity then the Air, and having likewise a greater congruity to Glass then the Air has, is terminated, by a concave Elliptico-spherical Figure, as *C K B*. For by its congruity it easily conforms it self, and adheres to the Glass, and constitutes as it were one containing body with it, and therefore should thrust the contained Air on that side it touches it, into a spherical Figure, as *B H C*, but the motion of Gravity depressing a little the Corners *B* and *C*, reduces it into the afore-said Figure *C K B*. Now that it is the greater congruity of one of the two contiguous fluids, then of the other, to the containing solid, that causes the separating surfaces to be thus or thus figured: And that it is not because this or that figured surface is more proper, natural, or peculiar to one

one of these fluid bodies, then to the other, will appear from this; that the same fluids will by being put into differing solids, change their surfaces. For the same water, which in a Glass or wooden Vessel will have a concave surface upwards, and will rise higher in a smaller then a greater Pipe; the same water, I say, in the same Pipes greased over or oyled, will produce quite contrary effects; for it will have a protuberant and convex surface upwards, and will not rise so high in small, as in bigger Pipes: Nay, in the very same solid Vessel, you may make the very same two contiguous Liquids to alter their Surfaces; for taking a small Wine-glass, or such like Vessel, and pouring water gently into it, you shall perceive the surface of the water all the way concave, till it rise even with the top, when you shall find it (if you gently and carefully pour in more) to grow very protuberant and convex; the reason of which is plain; for that the solid sides of the containing body are no longer extended, to which the water does more readily adhere then the air; but it is henceforth to be included with air, which would reduce it into a hemisphere, but by reason of its gravity, it is flattened into an Oval. Quicksilver also which to Glass is more incongruous then Air (and thereby being put into a Glass-pipe, will not adhere to it, but by the more congruous air will be forced to have a very protuberant surface, and to rise higher in a greater then a lesser Pipe) this Quicksilver to clean Metal, especially to Gold, Silver, Tin, Lead, &c. Iron excepted, is more congruous then Air, and will not only stick to it, but have a concave Surface like water, and rise higher in a less, then in a greater Pipe.

In all these Examples it is evident, that there is an extraordinary and adventitious force, by which the globular Figure of the contained heterogeneous fluid is altered; neither can it be imagined, how it should otherwise be of any other Figure then Globular: For being by the heterogeneous fluid equally protruded every way, whatsoever part is protuberant, will be thereby depressed. From this cause it is, that in its effects it does very much resemble a round Spring (such as a Hoop.) For as in a round Spring there is required an additional pressure against two opposite sides, to reduce it into an Oval Form, or to force it in between the sides of a Hole, whose Diameter is less then that of the Spring, there must be a considerable force or protrusion against the concave or inner side of the Spring; So to alter this spherical constitution of an included fluid body, there is required more pressure against opposite sides to reduce it into an Oval; and, to press it into an Hole less in Diameter then it self, it requires a greater protrusion against all the other sides. What degrees of force are requisite to reduce them into longer and longer Ovals, or to press them into less and less holes, I have not yet experimentally calculated; but thus much by experiment I find in general, that there is alwayes required a greater pressure to close them into longer Ovals, or protude them into smaller holes. The necessity and reason of this, were it requisite, I could easily explain: but being not so necessary, and requiring more room and time then I have for it at present, I shall here omit it; and proceed to shew, that this may be presently found true, if Experiment be made with a